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SANITIZED VERSION OF EXTRACT FROM SEMIMONTHLY DEVELOPMENT REPORT FOR PERIOD ENDING SEPTEMBER 15, 1970

(EXTRACTED FROM CRD DOCUMENT # KGD-290/PT5)

Compiled by
S. G. Thornton
Environmental Management Division
OAK RIDGE K-25 SITE
for the Health Studies Agreement

December 21, 1995

Oak Ridge K-25 Site
Oak Ridge, Tennessee 37831-7314
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the U.S. DEPARTMENT OF ENERGY
under Contract DE-AC05-84OR21400

[redacted]

This document consists of 57 pages.
No. 53 of 75 copies, Series A

Date of Report: September 25, 1970 Report Number: K-GD-290, Part 5

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R-73263

SEMIMONTHLY DEVELOPMENT REPORT(U)

FOR PERIOD ENDING SEPTEMBER 15, 1970

to

Wm. J. Wilcox, Jr.
Technical Director
Production Plants

Gaseous Diffusion Development Division
H. E. Trammell, Superintendent

Laboratory Division
J. C. Barton, Superintendent

Separation Systems Division
E. C. Evans, Superintendent

SRD classification changed to CRD [illegible]
ADD Signature [illegible] Date

This downgrading is based on a single ADD review as authorized by DOE Office of Declassification [illegible] 18/94.

UNION CARBIDE CORPORATION
NUCLEAR DIVISION
Oak Ridge Gaseous Diffusion Plant
Oak Ridge, Tennessee

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GROUP 1 Excluded from automatic downgrading and declassification.

[redacted]

Process Gas Chromatography: Determination of Low Levels of Process Gases in the Purge Vent - J. G. Million (Weber - Chemical Analysis)

(Keywords: Gas Chromatography: Process Vent)

The laboratory development gas chromatograph has been returned to K-311-1 to continue an earlier study of the application of gas chromatography to the determination of low levels of process gases in the purge vent*. The study has been extended to include the determination of chlorine trifluoride and chloryl fluoride, and Coolant 114 as well as uranium hexafluoride. For this application chlorine trifluoride and chloryl fluoride are not resolved from one another but are presented as one peak. This adequately meets the needs of the operation. The extension of the analysis to gases in addition to uranium hexafluoride will aid in efficient operation of the purge cascade.

Results to date indicate the following limits of detection (in 25 cc volume) are obtainable (in terms of partial pressures):

$ClF_3 + ClO_2F$	0.006 mm Hg
Coolant 114	0.004 mm Hg
UF_6	0.002 mm Hg

In a process application the percentage or ppm limits of detection are, of course, dependent upon the sample pressure available. Thus for some sample pressures the limits of detection can be estimated:

	Limits of Detection, %		
Sample Pressure	ClF_3+ClO_2F	Coolant 114	UF_6
100 mm (~ 2 psia)	0.006	0.004	0.002
200 mm (~ 4 psia)	0.003	0.002	0.001
400 mm (~ 8 psia)	0.0015	0.001	0.0005

There is a probability of other gas constituents appearing, from time to time, which could interfere with the determination of one or more of these gases (e.g. high concentrations of hydrogen fluoride interfere with chlorine trifluoride). The study is continuing, to explore the area of potential interferences.

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* *Semimonthly Development Report for Period Ending May 31, 1969*, Union Carbide Corporation, Nuclear Division, Oak Ridge Gaseous Diffusion Plant, June 2, 1969 (K-GD-15, Part 23).

It seems probable that a process gas chromatograph could be assembled, using commercially available instruments and components for this application.

DISTRIBUTION

1. K-25 Site Records (RC)
2. ChemRisk/Shonka Research Associates
3. S. G. Thornton (K-25 EMD)
4. DOE Public Reading Room